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10/562,804	05/19/2008	Thomas Pullen	66969-0004	6079
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GKN Driveline/ITG c/o Kristin L. Murphy 39533 Woodward Avenue, suite 140 Bloomfield Hills, MI 48304			EXAMINER SAAD, ERIN BARRY	
			ART UNIT	PAPER NUMBER
			1735	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/562,804

**Applicant(s)**

PULLEN ET AL.

**Examiner**

ERIN B. SAAD

**Art Unit**

1735

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 February 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 19, 20 and 22-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 19, 20 and 22-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/2/2011 has been entered.

### ***Claim Objections***

2. Claims 1 and 31 are objected to because of the following informalities: Claims 1 and 31 both state without a shielding gas as a new amendment. This is not a new amendment and the Examiner requests that the underline be removed. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1, 19-20, 22-30, and 32-34 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to

reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claims 1 and 32, the new amendment to the claims state a tensile strength greater than 100 N/mm<sup>2</sup>. The specification discloses that the tensile strength is between 100-140 N/mm<sup>2</sup> (paragraph 45). This is considered new matter because the specification does not implicitly or explicitly disclose a range above 140 N/mm<sup>2</sup> which is encompassed by the newly claimed range. See MPEP 2163.05, part III.

Regarding claim 33, the newly added claim limitation states a thickness of less than 2.0 mm. The specification discloses a range of 1.0-3.0 mm (paragraph 37). This is considered new matter because the specification does not implicitly or explicitly disclose a range less than 1.0 mm which is encompassed by the newly claimed range. See MPEP 2163.05, part III.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 19-28, 30 and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lurenbaum (DE725619 from IDS filed on 12/29/2005) in view of Myers (6,811,633) and Holland et al. (5,139,704).

Regarding claim 1, Lurenbaum discloses a process for fixing a balancing weight on at least one location on a shaft by soldering (lines 1-35). Since Lurenbaum does not specifically state using a shielding gas for the soldering process, it is the Examiner's position that a shielding gas is not being used.

Lurenbaum does not specifically state that the shaft is hollow. However, Myers discloses joining balancing weights to a hollow driveshaft (abstract). To one skilled in the art at the time of the invention it would have obvious to use the method of soldering balancing weights of Lurenbaum to balance the hollow driveshaft of Myers because Myers discloses that hollow driveshafts have different variations in roundness, straightness and wall thickness that will create imbalances along the driveshaft (column 1 lines 29-44).

Lurenbaum does not specifically disclose that the solder is a flux-less solder foil. However, Holland discloses using flux-less solder foils for soldering metal components in a vacuum atmosphere (no shield gas required) (column 1 lines 29-37, column 2 lines 44-46, column 3 lines 44-56; column 4 line 63 to column 5 line1). To one skilled in the art at the time of the invention it would have been obvious to use a flux-less solder foil for soldering as this is a well known soldering material and Holland discloses that flux creates a problem of leaving a residue on the surface of the soldered component (column 1 lines 29-37).

Lurenbaum does not specifically state that the balancing weight has a soldered tensile strength greater than 100 N/mm<sup>2</sup>. Holland discloses using a tin-based solder for joining metal components, which is the same type of solder used in the current

invention. Since Holland is using a similar type of solder, it is the Examiner's position that the solder would produce similar a tensile strength. Furthermore, to one skilled in the art at the time of the invention it would have been obvious to use a solder that would create a tensile strength suitable for the everyday use of the drive shaft.

The recitation "for torque transmission at rotational speeds in the range of 3000-12000 rpm in a drive system for a vehicle" is intended use. During examination, statements in the preamble reciting the purpose or intended use of the claimed invention must be evaluated to determine whether the recited purpose or intended use results in a structural difference (or, in the case of process claims, manipulative difference) between the claimed invention and the prior art. If so, the recitation serves to limit the claim. See, e.g., *In re Otto*, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963) (MPEP 2111.02).

Regarding claim 19, Lurenbaum discloses that the balancing weight may be attached by soldering (lines 1-35). Since solder is known as "soft solder", it is the Examiner's position that the solder of Lurenbaum is a soft solder.

Regarding claim 20, Lurenbaum discloses that the balancing weight may be attached by soldering (lines 1-35). Since soldering is completed at temperatures below 450 C, it is the Examiner's position that the soldering of the balancing weights of Lurenbaum would be completed at a temperature lower than 450 C.

Regarding claims 22-24, Lurenbaum does not specifically disclose that the soldering step at the at least one location is no longer than 3 seconds. However, taken in its broadest reasonable interpretation, the "soldering step" is taken to be the

instantaneous moment when the balancing weight is joined to the shaft. It is the Examiner's position that the soldering step of Lurenbaum is not longer than 3 seconds.

Regarding claims 25-26, Lurenbaum does not specifically disclose a joining force of less than 2000 Newton is exerted on the at least one balancing weight towards the hollow shaft. However, during the soldering of the balancing weight to the hollow shaft, there is going to be at least some force exerted to place the balancing weight into position on the hollow shaft and this force would inherently be less than 2000 Newton because such a force is equivalent to 450 lbf. One of ordinary skill in the art would have readily appreciated that a soldering process of this nature would never be carried out at a force exceeding 2000 Newton because this would damage the shaft during the soldering process. However, if it is not taken that the reference inherently meets this limitation, then it would have been obvious to carry out the soldering process without exceeding a force of 2000 Newton to prevent damage to the parts.

Regarding claim 27, Lurenbaum does not specifically disclose that the balancing weight is first provided with solder material and, thereafter, fixed to the hollow shaft. However, it would necessarily flow that the solder material would be provided to the balancing weight before being fixed to the hollow shaft, otherwise there would be no soldering occurring between the balancing weight and the shaft.

Regarding claim 28, Lurenbaum does not disclose that a plurality of balancing weights is fixed, and at least in some cases, different quantities of solder material are provided at the balancing weights. Lurenbaum discloses soldering a balancing weight to shaft. Myers discloses that a plurality of balancing weights may be added to the

shaft. Myers also discloses that the sizes of balancing weights can be varied (column 5 line 65- column 5 line 4 and column 6 line 27-30). To one skilled in the art at the time of the invention it would have been obvious to use multiple balancing weights because Myers discloses that it provides different amounts of weight for facilitating the balancing process and for stress control (column 5 line 65- column 5 line 4 and column 6 line 27-30). Myers does not disclose using different amount of solder/joining material on the balancing weights. However, to one skilled in the art at the time of the invention it would have been obvious to use different amounts of solder depending on the size of the balancing weights. The bigger the weight, the more solder would need to be used to ensure a proper bond between the weight and the shaft.

Regarding claim 30, Lurenbaum does not disclose that the balancing of the hollow shaft and the soldering of the at least one balancing weight are carried out on a single machine. However, Myers discloses balancing a hollow shaft and joining of balancing weights using a single machine. Myers discloses that the shaft is placed on a balancing machine. After balancing, the weights are joined to the surface. Myers discloses that the shaft is then re-balanced. After re-balancing the shaft is removed from the machine. Myers does not specifically state that the weights are joined to the shaft while on the balancing machine. However, it is the Examiner's position that the shaft is still on the balancing machine because Myers does not disclose removing the shaft from the machine until after it is re-balanced (after joining of the weights) (column 4 lines 28-48, column 6 lines 11-30). To one skilled in the art at the time of the invention it would have been obvious to use the balancing-joining method of Myers with the



soldering method of Lurenbaum to ensure that the balancing weights are placed at the correct locations during soldering.

Regarding claim 31, Lurenbaum discloses a process for fixing a balancing weight on at least one location on a hollow shaft by soldering (lines 1-35). Lurenbaum does not disclose brazing. However, brazing is an obvious variant to soldering. Soldering and brazing of the balancing weight to the shaft would provide similar results. Since Lurenbaum does not specifically state using a shielding gas for the soldering process, it is the Examiner's position that a shielding gas is not being used.

Lurenbaum does not specifically disclose that the solder is a flux-less solder. However, Holland discloses using flux-less solder for soldering metal components in a vacuum atmosphere (no shielding gas required) (column 1 lines 29-37, column 2 lines 44-46, column 3 lines 44-56; column 4 line 64 to column 5 line 1).

To one skilled in the art at the time of the invention it would have been obvious to use a flux-less solder for soldering as this is a well known soldering material and Holland discloses that flux creates a problem of leaving a residue on the surface of the soldered component (column 1 lines 29-37).

The recitation "for torque transmission at rotational speeds in the range of 3000-12000 rpm in a drive system for a vehicle" is intended use. During examination, statements in the preamble reciting the purpose or intended use of the claimed invention must be evaluated to determine whether the recited purpose or intended use results in a structural difference (or, in the case of process claims, manipulative difference) between the claimed invention and the prior art. If so, the recitation serves to

limit the claim. See, e.g., *In re Otto*, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963) (MPEP 2111.02).

Regarding claim 32, Lurenbaum discloses a process for fixing a balancing weight on at least one location on a shaft by soldering (lines 1-35). Since Lurenbaum does not specifically state using a shielding gas for the soldering process, it is the Examiner's position that a shielding gas is not being used.

Lurenbaum does not specifically state that the shaft is hollow. However, Myers discloses joining balancing weights to a hollow driveshaft (abstract). To one skilled in the art at the time of the invention it would have obvious to use the method of soldering balancing weights of Lurenbaum to balance the hollow driveshaft of Myers because Myers discloses that hollow driveshafts have different variations in roundness, straightness and wall thickness that will create imbalances along the driveshaft (column 1 lines 29-44).

Lurenbaum does not specifically disclose that the solder is a flux-less solder foil. However, Holland discloses using flux-less tin-based solder foils for soldering metal components in a vacuum atmosphere (no shield gas required) (column 1 lines 29-37, column 2 lines 44-46, lines 55-65, column 3 lines 44-56; column 4 line 63 to column 5 line1). To one skilled in the art at the time of the invention it would have been obvious to use a flux-less tin-based solder foil for soldering as this is a well known soldering material and Holland discloses that flux creates a problem of leaving a residue on the surface of the soldered component (column 1 lines 29-37).

Lurenbaum does not specifically state that the balancing weight has a soldered tensile strength greater than 100 N/mm<sup>2</sup>. Holland discloses using a tin-based solder for joining metal components, which is the same type of solder used in the current invention. Since Holland is using a similar type of solder, it is the Examiner's position that the solder would produce similar a tensile strength. Furthermore, to one skilled in the art at the time of the invention it would have been obvious to use a solder that would create a tensile strength suitable for the everyday use of the drive shaft.

The recitation "for torque transmission at rotational speeds in the range of 3000-12000 rpm in a drive system for a vehicle" is intended use. During examination, statements in the preamble reciting the purpose or intended use of the claimed invention must be evaluated to determine whether the recited purpose or intended use results in a structural difference (or, in the case of process claims, manipulative difference) between the claimed invention and the prior art. If so, the recitation serves to limit the claim. See, e.g., *In re Otto*, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963) (MPEP 2111.02).

4. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lurenbaum (DE725619 from IDS filed on 12/29/2005), Myers (6,811,633) and Holland et al. (5,139,704) as applied to claim 1 above, and further in view of Porter et al. (2,914,642).

Regarding claim 29, Lurenbaum does not specifically disclose that the heat sources used for the soldering step are either inductor or convector heaters. However,

Porter discloses using an induction heater for soldering components (column 1 lines 21-45). To one skilled in the art at the time of the invention it would have been obvious to use an induction heater for soldering because Porter discloses that the induction heater reduces oxides on the faces of the surfaces being joined to promote an effective union (column 1 lines 21-30).

5. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lurenbaum (DE725619 from IDS filed on 12/29/2005), Myers (6,811,633) and Holland et al. (5,139,704) as applied to claim 1 above, and further in view Helgesen et al. (5,234,378).

Regarding claim 33, Lurenbaum with Myers is silent to the wall thickness of the hollow driveshaft. However, Helgesen discloses a hollow driveshaft for an automobile with a wall thickness of 0.06-0.08 inches (1.52-2.03 mm) (column 3 lines 41-51). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) (MPEP 2144.05). To one skilled in the art at the time of the invention it would have been obvious to use a driveshaft with a wall thickness suitable for the specific use of the particular driveshaft.

6. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lurenbaum (DE725619 from IDS filed on 12/29/2005), Myers (6,811,633) and Holland

et al. (5,139,704) as applied to claim 1 above, and further in view of the combined teachings of Reinhardt et al. (6,050,900) and Welsh et al. (6,032,551).

Regarding claim 34, Lurenbaum does not specifically disclose that the balancing weight has a density of at least  $7.0 \text{ g/cm}^3$ . However, Reinhardt and Welsh both disclose using balancing weights made of steel (density approx.  $7.9 \text{ g/cm}^3$ - Reinhardt) (column 5 lines 6-27-Reinhardt and column 2 lines 50-55- Welsh). To one skilled in the art at the time of the invention it would have been obvious to use a high density material such as steel for the balancing weight as Welsh discloses that this is a well known material for balancing weights (column 2 lines 50-55).

### ***Response to Arguments***

Applicant's arguments with respect to claims 1, 19-20, 22-34 have been considered but are moot in view of the new ground(s) of rejection.

7. The Applicant argues that Myers does not teach soldering a balancing weight to a driveshaft and that Myers teaches away from soldering because Myers discloses using "ultraviolet radiation for a curing process because it does not cause undesirable localized heating of the driveshaft".

The Examiner disagrees. Lurenbaum discloses soldering balancing weights to a shaft. Lurenbaum was silent to the shaft being hollow. Myers was simply used as a secondary reference to show that it is well known to attach balancing weights to a hollow shaft.

8. The Applicant argues that independent claim 1 has been amended to state "securing the at least one balancing weight to the at least one location by soldering without a shielding gas, wherein one of a tin-based and zinc-based flux-free solder with a soldered tensile strength greater than 100 N/mm<sup>2</sup> is applied as a foil" and that Lurenbaum, alone or in combination with Myers and Holland, fail to teach, suggest, or disclose at least this recitation.

The Examiner disagrees. Independent claim 1 does not state "tin-based or zinc-based solder". As stated in the rejection above, Lurenbaum does not specifically state that the balancing weight has a soldered tensile strength greater than 100 N/mm<sup>2</sup>. Holland discloses using a tin-based solder for joining metal components, which is the same type of solder used in the current invention. Since Holland is using a similar type of solder, it is the Examiner's position that the solder would produce similar a tensile strength. Furthermore, to one skilled in the art at the time of the invention it would have been obvious to use a solder that would create a tensile strength suitable for the everyday use of the drive shaft.

9. The Applicant argues that the Examiner admitted that Lurenbaum does not specifically state using a shielding gas for soldering. The Applicant argued that the position the Examiner took that since no shielding gas was disclosed; that no shielding gas was used in the process was insufficient to establish a prima facie case of obviousness.

The Examiner disagrees. The Examiner was not stating that this was obvious. The Examiner was simply stating that since Lurenbaum does not mention a shielding

gas within the soldering process, Lurenbaum does not use a shielding gas. The burden falls to the Applicant to prove otherwise.

10. The Applicant argues that Holland teaches a vacuum atmosphere (no shielding gas) which would require the incorporation of a vacuum chamber into the process in which the shaft were to be placed which would lead to higher production costs and would entail a much larger technical outlay than applying a shielding gas to a soldering operation. The Applicant argues that this goes against the present invention because the specification discloses that the claimed process is advantageous because soldering process is very short which allows for in-line production, i.e. the component does not have to be removed from the production flow or balancing process (claim 31). The Applicant argues that no motivation exists for combining the prior art in this manner.

The Examiner disagrees. Holland discloses that the fluxless solder may be used in a vacuum atmosphere (column 4 line 64 to column 5 line 1). The Applicant has not provided evidence that incorporating a vacuum atmosphere into the process of Lurenbaum and Myers would create higher costs or a much larger technical outlay than applying a shielding gas. Furthermore, the Examiner believes that to one of ordinary skill in the art it would have been obvious to provide a vacuum atmosphere as it is well known to prevent oxidation during a soldering process.

11. The Applicant argues that independent claim 31 is not taught by the prior art for the reasons previously state.

The Examiner disagrees for the same reasons as above.

12. The Applicant argues that the prior art does not disclose the limitations of claim 29 because they do not teach the limitations of claim 1.

The Examiner disagrees for the reasons stated above.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIN B. SAAD whose telephone number is (571)270-3634. The examiner can normally be reached on Monday through Thursday from 8am-5pm Eastern time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on (571) 272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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/E. B. S./  
Examiner, Art Unit 1735  
2/3/2011

/Jessica L. Ward/  
Supervisory Patent Examiner, Art Unit 1735